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To: Rob Petre

From: Ted Snow T. A. S.

Subject: Final reports, grants NAG5-1457 and NAG5-1796

I have been reminded that final reports have not been provided you on the two subject grants. I apologize for the delay, which was due primarily to our hopes of eventually deriving useful information from the ROSAT data which were the subject of these grants.

Unfortunately these hopes have not been realized. The goal of both programs was to determine whether B-emission stars are sources of soft X-ray emission, but no detections were achieved and the resulting limits appear to be uninteresting. Thus no publications are expected to result from this work.

B-emission (aka Be) stars are hot stars having circumstellar material, as indicated by the presence of optical emission lines (primarily the Balmer series, but also infrared series). Earlier UV work (largely by myself and collaborators) had shown that Be stars were more likely than normal B stars of similar spectral type to have stellar winds. It was established that these winds represented mass-loss rates comparable to those of the hotter and more luminous O and B stars, scaled for the lower lminosity, thus suggesting that the wind mechanism is similar. Since the O and B stars are also soft X-ray emitters, it appeared a natural follow-on to see whether the Be stars emit soft X-rays, and if so, whether the X-ray luminosity appears in the same proportion to optical luminosity as in the O and B stars. If so, then we could have concluded that the wind mechanisms are similar; if not, then we might have decided that the winds in Be stars arise from a different machanism than the winds in O and B stars.

Our approach (and our funding) was two-fold: (1) obtain data on selected targets for pointed ROSAT observations; and (2) participate in the ROSAT all-sky survey to seek Be stars that might have been detected (at lower levels of sensitivity).

Unfortunately, neither of these approaches has proven fruitful. Our proposal for pointed observations was approved for only two targets (not of our choosing), and neither was detected by ROSAT. The detection limits were insufficiently rigorous to preclude any hypothesis regarding possible X-ray emission from these stars. In other words, the ROSAT sensitivity in our observations proved to be incapable of testing our hypothesis about the origin of the Be-star winds. Therefore we have published nothing about our results, because they would contribute nothing to our knowledge of Be stars.

The all-sky survey work was derailed by shortage of funds and delays in obtaining from MPI the dataset from the all-sky survey. I believe it may now be possible to carry out this work through Internet access to the all-sky survey, and I plan to make the attempt during the coming months.